CBCS SCHEME

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15AU72

Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019
Automotive Engine Components

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 a. What is a need of cylinder liner? Briefly explain dry type liners. **(06 Marks)**

b. The cylinder of a four stroke diesel engine has the following specifications. Brake power = 5kW, Speed = 600rpm, Indicated mean effective pressure = 0.5MPa, Mechanical efficiency = 80%, Stroke length to cylinder diameter ratio = 1.5, allowable circumferential stress for cylinder liner = 50MPa, Maximum gas pressure = 5N/mm^2, reboring allowance = 3.36mm, Allowable circumferential stress for cylinder head = 40MPa. Calculate :

i) Bore and length of the cylinder liner
ii) Thickness of cylinder lines
iii) Thickness of cylinder head. **(10 Marks)**

OR

2 a. With a neat sketch, explain any two methods of compensation of thermal expansion in piston. **(08 Marks)**

b. The following data is given for the piston of a four stroke diesel engine. Cylinder bore = 250mm, maximum gas pressure = 4MPa, Bearing pressure at small end of connecting rod = 15Mpa, Length of piston pin in bush of small end of connecting rod = 0.45×bore, Ratio of inner diameter to outer diameter of piston pin = 84 N/mm^2. Calculate :

i) Outer diameter of the piston pin
ii) Inner diameter of the piston pin
iii) Check the design for bending. **(08 Marks)**

Module-2

3 a. Explain buckling of connecting rod. **(07 Marks)**

b. Briefly explain whipping stress **(02 Marks)**

c. Determine the dimensions of cross section of the connecting rod for a diesel engine with the following data:
Cylinder bore = 125mm, Length of connecting rod = 300mm,
maximum gas pressure = 3.5MPa, Factor of safety = 5,
compressive yield stress = 330 N/mm^2 **(07 Marks)**

OR

4 a. Design a centre crankshaft at top dead centre position. **(10 Marks)**

b. With neat sketch, explain vibration dampers. **(06 Marks)**

Module-3

5 a. With a neat sketch, explain single row overhead valve (side camshaft) mechanism. **(08 Marks)**

b. State the necessity of valve rotators. With a neat sketch, explain free type of valve rotator. **(08 Marks)**

OR

6 a. With a neat sketch, explain different scavenging systems. **(10 Marks)**
b. With suitable notations, define the following scavenging parameters.
i) Delivery Ratio ii) Trapping efficiency iii) Scavenging efficiency. **(06 Marks)**

Module-4

7 a. Briefly explain components of an intake system of engine. **(08 Marks)**
b. With a neat sketch, explain any two type of Mufflers. **(08 Marks)**

OR

8 a. With a neat sketch, explain pressurized water cooling system. **(08 Marks)**
b. State the advantages and limitations of Air cooling system. **(08 Marks)**

Module-5

9 a. With a neat sketch, explain pressure type of wet sump lubrication system used in automotive engine. **(08 Marks)**
b. With a neat sketch, explain cartridge type oil filter used in lubrication system. **(08 Marks)**

OR

10 a. State the limitations of super charging for petrol and diesel engines. **(07 Marks)**
b. With a neat sketch, explain turbo charger with an inter cooler for automotive engine. **(09 Marks)**

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